

Commonwealth of Kentucky
Division for Air Quality
PERMIT STATEMENT OF BASIS

DRAFT

Conditional Major / Synthetic Minor, Operating
Permit: F-07-019, Renewal
Audubon Metals, LLC

May 9, 2007

Vahid Bakhtiar, Reviewer

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| SOURCE ID: | 21-101-00118 |
| SOURCE A.I. #: | 1790 |
| ACTIVITY ID: | APE20060002 |

SOURCE DESCRIPTION:

Audubon Metals, LLC (hereby referred to as Audubon) receives non-ferrous metals from automobile shredding plant and produces high quality aluminum ingots for use in the automotive die-casting industry. The metal is a mixture of aluminum, zinc, copper, magnesium, and stainless steel. The material passes through five separation stations and is separated into steel, aluminum/magnesium mix, heavies, and high-quality aluminum categories. The high quality aluminum is then melted down in a smelter/converter furnace and cast into aluminum ingots. Audubon has the capability of processing either clean charge or delacquering scrap aluminum.

COMMENTS (PERMIT RENEWAL F-07-019):

Audubon is currently operating under Conditional Major Permit No. F-01-033 (R1). Audubon's application for renewal of the operating permit was received on December 15, 2006. An application was previously submitted for the implementation of significant revisions on March 13, 2006. The revisions requested in the application have been incorporated into the permit.

Three emission points from the hearths EP4a, EP4b, EP4c were added to the permit. These emission points vent to the atmosphere through stack flues #1, #2, and #3, respectively. Since three sidewells from three smelter/converter furnaces are routed to one baghouse, they have been designated to one emission point (EP3).

For thermal dryer only, more detailed requirements from 40 CFR 63 Subpart RRR has been added to the permit.

COMMENTS (SIGNIFICANT REVISION 1):

This application proposed the construction of a new rotary thermal dryer with hourly throughput rate of 16.45 tph of scrap aluminum to replace the existing one rated at 9.74 tph. This application also proposed that the previous combined control systems be separated. The new control devices will capture and vent the exhaust of the smelter/converter furnaces #1 through #3 (EP 3, 4, & 5) through the new 200,000 acfm dry scrubber/baghouse system. The old control devices will be used for the rotary thermal dryer (EP 6) with a total exhaust volume of 110,000 acfm through the current single stack. No changes were proposed in the scrap handling and other affected facilities. The changes made to permit are as follows:

1. For group 1 in Section B, the restriction to operate only two furnaces at one time by allowing 3 months of concurrent operation of the standby furnace was deleted. The following requirements have been added to Operation Limitations.
 - a. For the three furnaces (EP3, 4, & 5), only clean charge shall be used.
 - b. The permittee shall operate the associated scrubber and baghouse all the time while the furnaces or/and thermal dryer are in operation.
Compliance Demonstration: Records shall be kept of the times when the units are operating but the control devices are not. Records shall also be kept of the maintenance activities.
2. For group 1 in Section B, the rotary thermal dryer operating limitation has been increased from 9.74 tons/hour scrap feed to 16.45 tons/hour. For PM emission limit, the facility took the limit of 20.38 pounds/hour pursuant to 401 KAR 59:010, 25 tons/12-month rolling average from the dryer to avoid source wide PSD review (Synthetic Minor Limit).
3. For group 1 in Section B, the maximum allowed rate of demag chlorine flux usage from 40 lb/hr per furnace has been changed to 120 lbs/hr per furnace based on 3-hour average since 120 lbs/hr was the rate used during the previous stack testing for the furnaces.
4. For group 1 in Section B, the hydrogen Fluoride (HF) emissions limit for the furnaces (EP3-5) has been increased from 4.39 tons per year to 7.52 tons per year.
5. For group 1 in Section B, "For EP 3, 4, & 5, the permittee shall maintain on site a weekly log of the pressure drop across the baghouses and the scrubber and ensure all parameters remain within the range recommended by the manufacturer and/or standard operating practices" has been added to "7. Specific Control Equipment Operating Conditions". The related requirements have been added to Monitoring and Recordkeeping.
6. For group 1 in Section B, the original alternate operating scenarios has been deleted and the new alternate operating scenarios for EP 6: Rotary Thermal Dryer has been added. The lower quality scrap the facility anticipates needing to purchase in the future will certainly contain coated or painted aluminum scrap. In order to maintain the smelter/converter furnaces as clean charge only furnaces, the facility would like to operate the rotary thermal dryer as a "scrap dryer/delacquering kiln/decoating kiln" on an as needed basis.
7. The following insignificant activities have been added to Section C. These include twelve ladle heaters at 1 mmBtu/hr, three ladle heaters at 1.4 mmBtu/hr, a 3,000 gallon diesel fuel storage tank, a slaked lime storage bin, and a magnetite storage bin.
8. Since the three furnaces (EP 3-5) only process clean charge and they are at an area source of HAP(s), they are not subject to Secondary Aluminum MACT. Therefore, the requirements for these furnaces based on SACT have been taken off. SAPU and any language related to it have been taken off as well.
9. In Section D, "The permittee shall modify OM&M plan to include the scenario of Thermal Dryer acting as Scrap Dryer/Delacquering Kiln/Decoating Kiln, and submit it for KYDAQ's approval no later than 90 days after the final permit is issued. The permittee shall follow the operation and monitoring requirements implemented in the site-specific OM& M plan for the Thermal Dryer/Scrap Dryer/Delacquering Kiln/Decoating Kiln (EP6)." has been added.
10. The facility was required to monitor if the emission from several Emission Points was normal for the process, and this requirement has been taken off in this revised permit since it is not practical. The facility is still required to monitor if there is visible emission from those emission points and Method 9 reading is required if the visible emission is observed.

12/6/05 OFF PERMIT CHANGE: In 2005, Audubon constructed a new dry scrubber and baghouse for three furnaces and one rotary thermal dryer.

4/5/02 ORIGINAL ISSUANCE:

COMMENTS:

Originally, the application was received as a minor revision to Audubon's state origin permit S-98-094. However, the Division had determined that the construction of the standby furnace needs to be federally-enforceable to ensure that only 2 furnaces will be operated at any given time because Audubon had failed to prove that it is unable to operate all 3 furnaces at once. This was the main obstacle in the delayed issuance of this permit.

Since the new furnace is a standby unit and not more than 2 furnaces will be operated at any time, the net increase in the potential emission is zero. However, changes have been made to correct the existing plant total emissions. The PTE calculation errors in the previous review have been corrected as follow:

1. The existing HF emission factor of 2.85884 lbs/ton flux was corrected to reflect the amount of fluorides in the fluxing agent used. From the MSDS of the flux salt, a maximum of 6% is fluoride. The worst-case emission factor of 100 lbs particulate/ton flux is used as the basis. The resulting HF emission factor of 6 lbs/ton flux or 0.227 lb/ton aluminum is more conservative.
2. The MSDS of the fluxing agent shows presence of mineral oil. This suggests the emission of VOC, which was not accounted for in the previous review. The resulting VOC emission factor is 8 lbs/ton flux or 0.303 lb/ton aluminum.
3. The VOC and Cl compounds in the furnace results in dioxins and furans (D/F) emissions, which are subject to the area source requirements of the Secondary Aluminum MACT. Therefore, pollutant D/F is included in the existing PTE.
4. The chlorine and HCl emission factors of about 1000 lbs/ton is too high. From SCC 3-04-001-04 (fluxing/chlorination), this 1000 lbs/ton emission factor is for worst-case particulate emissions. Since the furnace pump ensures a chlorine utilization rate of 96%, the chlorine and HCl emission factor is $(1-96/100) * 1000 \text{ lbs/ton} = 40 \text{ lbs/ton chlorine or } 0.145 \text{ lb/ton aluminum}$.
5. In the previous review, control efficiency of the in-line lime injection was erroneously taken to be 99%, which is the particulate control efficiency of the baghouse. This may have been due to the assumption that the in-line dry lime injection is the lime injection in the baghouse. The current application and confirmation with the company's consultant (Mr. G. Trivedi) both indicate that the lime injection and the baghouse are separate units. The lime injection/dry scrubber has a control efficiency of 60%. Therefore, the control of the acid gases is only 60% instead of 99%.
6. Since control efficiency of the acid gases was reduced, the resulting emissions would increase. The source-wide emission of HF (4.39 TPY) was remodeled with ISCST3. The resulting ground level concentration is still below the 24-hour-average secondary ambient air quality standard of $2.86 \mu\text{g}/\text{m}^3$, which was applied in previous review.
7. Dross skimming of the furnaces is performed once every 8-hour shift and it lasts for about half an hour. Since Audubon is one of the 28 source categories, emissions from dross skimming is included as fugitive in this revision.
8. An existing emission point, the rotary dryer, was not included in the previous review. The rotary dryer uses heat to dry water, oil, and water/oil mixture off the aluminum scrap (source of VOC and D/F emissions). Emissions from this process are significant enough for the source to install an afterburner and a lime injection/dry scrubber-baghouse for the dryer. In addition, this emission point is defined as a thermal chip dryer, which is subject to area source requirements of the Secondary Aluminum MACT. Consequently, emissions from this point should be included in the existing plant PTE.
9. Fugitive dust emissions from vehicular traffic on the unpaved and paved roads, which were previously determined in reviews prior to S-98-094, were excluded in S-98-064. In this review, those emissions will be included to the existing PTE.

This permit is a conditional major for particulate. The permittee is required to test for particulate, visible, and D/F emissions. The following summarizes the applicable regulations:

- 401 KAR 52:030 – Federally-enforceable permits for non-major sources. Applies to source-wide particulate emissions.
- 401 KAR 53:010 – Ambient air quality standards. Applies to HF emissions.
- 401 KAR 59:010 – New process operations. Applies to particulate and visible emissions from all emission activities except for fuel usage and fugitive loss.
- 401 KAR 63:010 – Fugitive emissions. Applies to fugitive emissions.
- 401 KAR 63:020 – Potentially hazardous matter or toxic substances. Applies to Cl₂ and HCl emissions.
- 40 CFR 63 Subpart RRR – National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production. Applies to D/F emissions from each group 1 furnace, SAPU, and thermal chip dryer.

EMISSION AND OPERATING CAPS DESCRIPTION:

Emission caps are as follow:

| Emission Point | Pollutant | Allowable | Applicable Regulation |
|---|--|--|--|
| <p>Group 1:</p> <ul style="list-style-type: none"> • 003(E2-1, E2-2) Smelter/Converter Furnace #1 • 004(E2-3, E2-4) Smelter/Converter Furnace #2 • 005(E2-5, E2-6) Smelter/Converter Furnace #3 • Secondary Aluminum Processing Unit (SAPU): 003(E2-1, E2-2) and 004(E2-3, E2-4), or 003(E2-1, E2-2) and 005(E2-5, E2-6), or 004(E2-3, E2-4) and 005(E2-5, E2-6) • 006(-) Rotary Dryer | <ul style="list-style-type: none"> • Particulate / Opacity • HF • D/F (TEQ) | <p><u>Particulate/Opacity:</u></p> <ul style="list-style-type: none"> • Source-wide particulate emissions shall not exceed 98.5 tons/12-month rolling average. Self-imposed to preclude 401 KAR 52:020 – Title V permits. • For each furnace, particulate emission allowable is 6.16 pounds/hour, 27 tons/12-month rolling average. For the dryer, particulate emission allowable is 5.02 pounds/hour, 22 tons/12-month rolling average. • For each emission point, the opacity shall not equal or exceed 20%. <p><u>HF:</u></p> <ul style="list-style-type: none"> • Source-wide HF emissions shall not exceed 4.39 tons/12-month rolling average. <p><u>D/F:</u></p> <ul style="list-style-type: none"> • D/F emissions shall not exceed the limits specified in the applicable regulations for each group 1 furnace, thermal chip dryer, and SAPU. | <p><u>Particulate/Opacity:</u></p> <ul style="list-style-type: none"> • 401 KAR 52:030 - Self-imposed to preclude 401 KAR 52:020. • 401 KAR 59:010 <p><u>HF:</u> 401 KAR 53:010</p> <p><u>D/F:</u> 40 CFR 63 Subpart RRR §63.1505 (c)(2), (i)(3), and (k)(3)</p> |
| <p>Group 2:</p> <ul style="list-style-type: none"> • 001(E0) Raw material handling – non-ferrous metal scrap • 002(E1) Ring crusher and air classifier • 007(-) Vehicular Traffic Fugitive | <p>Particulate / Opacity</p> | <ul style="list-style-type: none"> • Particulate emission allowable is 1.14 pounds/hour, 5 tons/12-month rolling average for 001(E0), 0.34 pounds/hour, 1.5 tons/12-month rolling average for 002(E1), and 3.65 pounds/hour, 5 tons/12-month rolling average for 007(-). • For 007(-), the opacity shall not equal or exceed 20%. | <ul style="list-style-type: none"> • 401 KAR 52:030 - Self-imposed to preclude 401 KAR 52:020. • 401 KAR 59:010 |

Operating caps are as follow:

| Emission Point | Pollutant | Operating requirement | Applicable Regulation |
|---|--|---|---|
| <p>Group 1:</p> <ul style="list-style-type: none"> 003(E2-1, E2-2) Smelter/Converter Furnace #1 004(E2-3, E2-4) Smelter/Converter Furnace #2 005(E2-5, E2-6) Smelter/Converter Furnace #3 Secondary Aluminum Processing Unit (SAPU): 003(E2-1, E2-2) and 004(E2-3, E2-4), or 003(E2-1, E2-2) and 005(E2-5, E2-6), or 004(E2-3, E2-4) and 005(E2-5, E2-6) 006(-) Rotary Dryer <p>Group 2:</p> <ul style="list-style-type: none"> 001(E0) Raw material handling – non-ferrous metal scrap 002(E1) Ring crusher and air classifier <p>007(-) Vehicular Traffic Fugitive</p> | <ul style="list-style-type: none"> Particulate HAPs D/F (TEQ) | <p><u>Particulate:</u></p> <ul style="list-style-type: none"> The permittee shall not operate more than 2 furnaces at any given time. Self-imposed to preclude 401 KAR 52:020 – Title V permits. For each furnace, the permittee shall not process more than 5.5 ton/hour of scrap aluminum and base metal, 10,000 pounds/day of flux, and 40 pounds/hour of demag chlorine gas charge flux salt. For the dryer, the permittee shall not process more than 9.74 tons/hour of scrap aluminum. The permittee shall not process at rates that will cause source-wide particulate emissions to exceed 98.5 tons/12-month rolling average. Self-imposed to preclude 401 KAR 52:020 – Title V permits. The permittee shall comply with applicable operating standards in 401 KAR 63:010 Section 3. <p><u>HAPs:</u> The permittee shall comply with operating standard in 401 KAR 63:020 Section 3.</p> <p><u>D/F:</u></p> <ul style="list-style-type: none"> The permittee shall comply with applicable operating requirements specified in the applicable regulation for each group 1 furnace, thermal chip dryer, and SAPU. | <p><u>Particulate:</u></p> <ul style="list-style-type: none"> 401 KAR 52:030 - Self-imposed to preclude 401 KAR 52:020. 401 KAR 63:010 <p><u>HAPs:</u> 401 KAR 63:020</p> <p><u>D/F:</u></p> <ul style="list-style-type: none"> 40 CFR 63 Subpart RRR §63.1506 |

PERIODIC MONITORING:

Periodic monitoring requirements are as follow:

- i. The type and monthly amount of scrap aluminum processed.
- ii. Perform a qualitative visual observation of the opacity of emissions from each stack or vent on a monthly basis and maintain a log of the observation
- iii. The monthly total vehicles miles traveled for paved and unpaved roads.
- iv. The monthly hours of operation of each emission point.
- v. The applicable periodic monitoring requirements in 40 CFR 63 Subpart RRR §63.1510, which include furnace, dryer, flux, lime, and baghouse monitoring.

OPERATIONAL FLEXIBILITY:**Alternate Operating Scenarios:**

Scenario 1: Smelter/Converter Furnace #1 and Smelter/Converter Furnace #2 operating simultaneously with the following control scenario:

- E2-1 and E2-3 exhausting through the dry scrubber/baghouse and
- E2-2 and E2-4 exhausting through the afterburner and dry scrubber/baghouse via the rotary dryer or E2-2 and E2-4 exhausting uncontrolled to the atmosphere when auxiliary natural gas is utilized in rotary dryer.

Scenario 2: Smelter/Converter Furnace #1 and Smelter/Converter Furnace #3 operating simultaneously with the following control scenario:

- E2-1 and E2-5 exhausting through the dry scrubber/baghouse,
- E2-2 exhausting through afterburner and dry scrubber/baghouse via the rotary dryer or E2-2 exhausting uncontrolled to the atmosphere when auxiliary natural gas is utilized in rotary dryer.
- E2-6 exhausting uncontrolled to the atmosphere.

Scenario 3: Smelter/Converter Furnace #2 and Smelter/Converter Furnace #3 operating simultaneously with the following control scenario:

- E2-3 and E2-5 exhausting through the dry scrubber/baghouse,
- E2-4 exhausting through afterburner and dry scrubber/baghouse via the rotary dryer or E2-4 exhausting uncontrolled to the atmosphere when auxiliary natural gas is utilized in rotary dryer.
- E2-6 exhausting uncontrolled to the atmosphere.

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.